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[Second Edition.]

## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION.

#### Improvements in or relating to Showerproof Fabrics and the like Materials.

We, INTERNATIONAL LATEX PROCESSES LIMITED, of 10, Lefelvre Street, St. Peter's Port, Guernsey, Channel Islands, a Company incorporated under the Laws 5 of Guernsey, EDWARD ARTHUR MURPHY and EVELYN WILLIAM MADGE, both British Subjects, of Fort Dunlop, Erdington, Birmingham, in the County of Warwick, do hereby declare the nature of this invention to be as follows:—

This invention concerns improvements in or relating to showerproof fabrics and the like materials.

15 The object of the present invention is to produce showerproof fabrics and the like materials comprising woven fibrous material and unmasticated rubber which are porous to gases and vapours and 20 impenetrable to a small head of aqueous liquid suitable for example for raincoat material, waterproof garments or waterproof linings.

It is well known that by employing 25 aqueous dispersions of rubber it is possible to produce rubber-coated fabrics such as garments, either single or double texture, waterproof clothing, dipped goods such as footwear, surgeons' gloves.

30 It is to be understood that the final product produced according to the present invention is to resemble the original fabric more than a rubber-coated fabric such as a mackintosh.

According to the present invention, therefore, the process for the manufacture of showerproof fabrics and the like materials comprises treating as by 35 immersing woven fabrics with aqueous dispersions of the kinds hereinafter specified, the aforesaid dispersions being at a concentration of not more than approximately 20% total solids and preferably 45 not more than approximately 10% total solids and in admixture with materials which make rubber water-repellent.

If an aqueous dispersion of approximately 20% total solids concentration is 50 employed the resulting product although not possessing a continuous coating of rubber is nevertheless definitely "rubbery". Employing, however, an

aqueous dispersion of not more than 10% total solids concentration a non-rubbery product is produced. It is usually desirable according to the invention to produce materials having a non-rubbery nature.

The materials which make rubber water-repellent employed in accordance with the invention are solid organic materials which have a high angle of contact with respect to water. Such materials are for example the higher 60 members of the homologous series i.e. paraffins, esters, fatty acids, alcohols; chlorinated compounds such as halowax (a Registered Trade Mark).

An advantage according to the invention is that hard waxes can be employed in admixture with the aqueous dispersions of rubber aforesaid. It is known to produce waterproof fabrics by immersing the fabric in a petroleum solution of a soft wax. Although a soft wax readily marks and so it would be desirable to employ a hard wax, nevertheless heretofore a hard wax could not be used successfully because these waxes crack far too easily. If, however, in accordance with the present invention a hard wax is admixed with an aqueous dispersion of rubber the presence of the rubber makes the hard wax flexible and thus permits its use for the production of showerproof fabrics.

The coagulation of the aqueous dispersion of rubber or the like can be effected by heat, e.g. by drying or by contacting with a suitable coagulant.

The emulsions or dispersions of rubber or the like comprise those consisting of rubber, gutta-percha, balata or similar vegetable resins occurring naturally or in vulcanised condition or artificially obtained. Such artificial aqueous dispersions may include those of coagulated rubber, vulcanised rubber, waste or reclaim.

If desired, any of the aforementioned dispersions may be used alone or in admixture with one another.

Any of the aforesaid dispersions may contain the usual known compounding 105 and vulcanising ingredients and/or may

be in the first instance in concentrated form.

Concentrates such as are obtained in Specifications Nos. 290,313 and 219,635

5 to which may be added any one or more of the usual known compounding ingredients may also be employed.

The following is a specific example of the manner in which the invention may 10 be carried into effect.

Untreated gabardine or fabric known as Indiana fabric is immersed in a bath of rubber latex mixing of approximately 15

10% concentration and of composition—rubber 50 parts by weight, carnauba wax 50 parts by weight. After soaking, the

gabardine or Indiana fabric is removed from the bath, washed superficially and immersed in a 10% solution of aluminium chloride. The aluminium 20 chloride insolubilises the soap and other materials used in the preparation of the carnauba wax dispersion and also coagulates the rubber latex. The cloth is then rinsed in water to remove the 25 excess aluminium salts, and subsequently dried and ironed. The final product is strongly water-repellent but porous to gases and vapours.

Dated this 21st day of December, 1934.

R. F. MCKAY,  
Acting for the Applicants.

#### COMPLETE SPECIFICATION.

#### Improvements in or relating to Showerproof Fabrics and the like Materials.

30 We, INTERNATIONAL LATEX PROCESSES LIMITED, of 10, Lefebvre Street, St. Peter's Port, Guernsey, Channel Islands, a Company incorporated under the Laws of Guernsey, EDWARD ARTHUR MURPHY 35 and EVELYN WILLIAM MADGE, both British Subjects, of Fort Dunlop, Edwington, Birmingham, in the County of Warwick, do hereby declare the nature of this invention and in what manner 40 the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention concerns improvements in or relating to showerproof fabrics and the like materials.

The object of the present invention is to produce showerproof fabrics and the like materials comprising woven fibrous material and rubber which are porous to gases and vapours and impenetrable to a small head of aqueous liquid suitable for example for raincoat material, waterproof garments or waterproof linings. It is also to be understood that the final 55 product produced according to the present invention is to resemble the original fabric more than a rubber-coated fabric such as a mackintosh.

It is well known that by employing aqueous dispersions of rubber it is possible to produce rubber-coated fabrics such as garments, either single or double texture, waterproof clothing, dipped goods such as footwear, surgeons' gloves.

It has also been proposed to provide cellulosic or fibrous materials with an improved form of protective coating or layer by the application of compositions comprising rubber or similar vegetable resins in the form of aqueous emulsions

or dispersions thereof in admixture with an aqueous dispersion of a wax or mixture of waxes wherein the wax content in the aforesaid compositions lies between the order of 20% and 95% on the dry rubber-wax content, but no indication is given in this prior proposal that by altering the degree of dilution of the compositions it is possible to use 75 these compositions in a process for the production of showerproof fabrics, i.e., fabrics which while water-repellent are yet permeable to gases and vapours.

According to the present invention, therefore, the process for the manufacture of showerproof fabrics and the like materials comprises treating, as by immersing, woven fabrics with aqueous dispersions having a concentration of not more than 20% total solids and preferably not more than approximately 10% total solids and comprising an admixture of one or more aqueous dispersions of rubber of the kinds hereinafter specified and aqueous dispersions of the requisite quantity, i.e. usually at least about 25% on the dry rubber of one or more solid water-repellent organic materials of the kinds herein specified 80 and coagulating the aqueous dispersion of rubber and solid water-repellent organic material taken up by the fabric.

If an aqueous dispersion of approximately 20% total solids concentration 85 is employed the resulting product although not possessing a continuous coating of rubber is nevertheless definitely "rubbery". Employing, however, an aqueous dispersion of not 90 more than 10% total solids concentration a non-rubby product is produced. It 95 is usually desirable according to the in-

vention to produce finished shower-proof fabric having a non-rubbery nature.

The water-repellent solid organic materials, employed in accordance with the invention are the higher members of the homologues series, i.e. paraffins, esters, fatty acids, alcohols; chlorinated naphthalenes such as "halowax" (a Registered Trade Mark).

An advantage according to the invention is that hard waxes can be employed in admixture with the aqueous dispersions of rubber aforesaid. It is known to produce waterproof fabrics by immersing the fabric in a petroleum solution of a soft wax. Although a soft wax readily marks and so it would be desirable to employ a hard wax, nevertheless heretofore a hard wax could not be used successfully because these waxes crack far too easily. If, however, in accordance with the present invention a dispersion of a hard wax is admixed with an aqueous dispersion of rubber the presence of the rubber makes the hard wax flexible and thus permits its use for the production of showerproof fabrics.

The coagulation of the mixture of aqueous dispersion of rubber or the like and aqueous dispersion of solid organic material can be effected by heat, e.g. by drying or by contacting with a suitable coagulant.

The emulsions or dispersions of rubber or the like comprise those consisting of rubber, gutta-percha, balata or similar vegetable resins occurring naturally or in vulcanised condition or artificially obtained. Such artificial aqueous dispersions may include those of coagulated rubber, vulcanised rubber, waste or reclaim.

If desired, any of the aforementioned dispersions may be used alone or in admixture with one another.

Any of the aforesaid dispersions may contain the usual known compounding and vulcanising ingredients and/or may be in the first instance in concentrated form.

Concentrates such as are obtained in Specifications Nos. 290,318 and 219,635 to which may be added any one or more of the usual known compounding ingredients may also be employed after dilution to the required degree.

The following is a specific example of the manner in which the invention may be carried into effect.

Untreated gabardine or fabric known as Indiana fabric is immersed in an aqueous dispersion having a concentration of approximately 10% total solids and comprising an admixture of rubber latex and an aqueous dispersion of carnauba wax in such proportion that equal parts by weight of rubber and carnauba wax are present.

The aqueous dispersion of carnauba wax is prepared so as to contain:—

- Carnauba wax—100 parts by weight
- Stearic acid (as ammonium stearate)—4 parts by weight
- Glue—1.5 parts by weight

by dispersing a molten mixture of stearic acid and carnauba wax in a hot ammoniacal glue solution, and afterwards passing this dispersion through a Premier Mill.

The gabardine or Indiana fabric, after soaking, is removed from the aqueous dispersion of rubber and carnauba wax, washed superficially and immersed in a 10% solution of aluminium chloride, which coagulates the rubber latex and carnauba wax dispersion and also insolubilises the ammonium stearate. The cloth is then rinsed in water to remove the excess aluminium chloride, and subsequently dried and ironed. The final product is strongly water-repellent but porous to gases and vapours.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process for the manufacture of showerproof fabrics and the like materials which comprises treating, as by immersing, woven fabrics with aqueous dispersions having a concentration of not more than 20% total solids and preferably not more than approximately 10% total solids and comprising an admixture of one or more aqueous dispersions of rubber of the kinds hereinbefore specified and aqueous dispersions of the requisite quantity i.e. 100 usually at least 25% on the dry rubber of one or more water-repellent solid organic materials of the kinds herein specified and coagulating the aqueous dispersion of rubber and solid water-repellent organic material taken up by the fabric.
2. A process as claimed in Claim 1 substantially as described with reference to the foregoing example.
3. The process for the manufacture of showerproof fabrics and the like materials substantially as described.
4. Showerproof and the like materials when produced by the process claimed in any of the preceding Claims.

Dated this 9th day of August, 1935.

R. F. McKAY,  
Acting for the Applicants.